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World Chronicle

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WORLD ENERGY

CHARLES CONSTANTINOU, Chief of the Energy and Natural Resources Branch of the United Nations Department of Policy Coordination and Sustainable Development, discusses a wide range of energy issues. The price of oil and natural gas is the lowest in many years due to conservation measures taken by countries and the use of modern technologies in the development of all sources of energy. Mr. Constantinou believes that all sources of energy, even those friendly to the environment, have a cost, and that a new global strategy on safe energy is needed to maintain economic development and protect the environment.

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ANNOUNCER: From United Nations Headquarters in New York, this is **World Chronicle**, an unedited interview programme about major global issues. Here now to introduce our guest is the host of today's **World Chronicle**.

LITTLEJOHNS: I'm Michael Littlejohns, and this is **World Chronicle**. Today the world energy situation is relatively tranquil. Reserves of fossil fuels are abundant, prices are stable and there have been significant advances in energy technologies. However, many developing countries continue to depend on traditional energy sources and consequently suffer from energy poverty, with far-reaching economic, social and environmental consequences. How can these countries overcome their energy problems and achieve sustainable economic development without further damaging the environment?

Our guest today is an expert on energy trends and prospects. He's Charles Constantinou, Chief of the Energy and Natural Resources Branch of the United Nations Department of Policy Coordination and Sustainable Development. Joining me to talk to Mr. Constantinou are Walter Pfaeffle of the Kuwait News Agency and Ted Morello of the *Far Eastern Economic Review*. Mr. Constantinou, welcome to World Chronicle.

Mr. Constantinou, as we've pointed out, the price of oil is relatively stable as we do this program. The prices range between about $12 and $15 a gallon, depending on the quality of the product. Are you confident that prices will remain stable for the foreseeable future, or is there the possibility that we could head into another price rise spiral, which of course would have very serious effects on developing countries?

CONSTANTINOU: Well, first of all, I would like to say that the price range is $12 to $15 a barrel, and it is at the moment lower than it was last year by about $5 a barrel.

LITTLEJOHNS: Why is that?

CONSTANTINOU: Mainly, I think, because of a great diversification of sources of supply. We have been experiencing two main changes. One, it's a veritable explosion of new technologies which are being applied to the exploration and development of fossil fuels, but especially oil and gas. To give you an idea, in the North Sea, the development of oil is being done at six hundred to seven hundred feet. Now offshore Brazil, offshore Rio de Janeiro, offshore the Gulf of Mexico here in the United States, we are producing oil from deeper than two thousand feet with very good possibilities of going to four thousand feet and deeper in the very near future.

LITTLEJOHNS: But surely the costs must be enormous when you get down to those depths.

CONSTANTINOU: No, amazingly, the costs are lower, the costs per unit of production. The overall costs, of course, for a particular project can be enormous, but the cost per barrel has come down. In the North Sea, the costs in real terms have gone down by 30 per cent in the last five years or so. These technological developments involve computers, the application of computers, three dimensional seismic surveys, horizontal drilling -- all sorts of new technologies for taking out of the ground more of the oil in place. We call them secondary and tertiary recovery methods. By the application of these technologies, we are extracting more oil from what has been discovered and at a lower cost than the other --

LITTLEJOHNS: So how is this going to impact on prices? Are we going down to $10 a gallon maybe?

CONSTANTINOU: I think this has already impacted on prices. In addition, another major development is the application of free market policies throughout the world and the opening up of vast new areas. And in the former Soviet Union, the countries of the former Soviet Union, now there are oil companies from the west already operating there. They are operating significantly in Kazakhstan for example. And there are agreements signed with Azerbaijan. And in both of these countries there are enormous reserves of oil. Some agreements have also been signed with Russia, but to a much lesser extent there. Similarly, China has opened up for onshore exploration. They have opened up before for offshore exploration only, but now they have invited the oil companies to go onshore as well. And most of the developing countries, including some countries of OPEC which had nationalized the foreign concessions in the 70s, now they're opening up: for example, Algeria and Venezuela. They have invited the oil companies, and they're back there helping in exploration and production of oil.

PFAEFFLE: Mr. Constantinou, we're talking a lot about oil and gas. These require big investments. But from a UN point of view shouldn't we be talking about other sources of energy that are better for the environment?

CONSTANTINOU: Well, yes. And in fact the United Nations system as a whole has been talking and considering the prospects of new and renewable sources of energy, frankly, right from the beginning of the UN. The first conference that looked into the sources of energy was a great success in 1948. It was followed up in '61 and then in '81 by other world-wide conferences on new and renewable sources of energy. And very recently a new energy committee met here at Headquarters to look into the development of all energy resources and look into the future to see what kind of energy policies need to be adopted world-wide, especially because of the increasing environmental concerns. Because the burning of coal, oil and gas has, on the one hand,

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fuelled economic development both in the industrialized countries and the developing world, but it has also caused enormous environmental problems.

LITTLEJOHNS: Plus all the tanker accidents.

CONSTANTINOU: In addition, yes.

PFAEFFLE: What you've said yourself, everything seems to depend on the price of oil. If the price of oil goes down, what chances do these alternate energy sources have?

CONSTANTINOU: Well, I do not think that the price is the only cause for developing other sources of energy. Technological breakthroughs, technological developments are influenced, of course, by competitive prices. But there are other considerations. It depends very much on the invention of somebody, or non-economic considerations -- security of supply, countries that like to depend on domestic energy sources, so to what extent are they going to devote capital for research and development, and so forth. All these things contribute to development of other sources of energy. Unfortunately, up to now the contribution of these technologies has been very small. The really new energy technologies right now contribute only 1.6 per cent to world energy.

MORELLO: But the focus seems to have been on financial incentive. What are the prospects of, for example, a gas company discouraging the development of so-called unconventional energies? As many governments have done. For instance, the United States in Colorado with the shale development that was very sexy at the time of the shortage in the '70s, shortage of petroleum, suddenly was dropped. And this kind of thing has been going on. There's been less and less emphasis on --

CONSTANTINOU: Many people have burned their fingers. They have lost hundreds and hundreds of millions of dollars.

MORELLO: But again, we're talking about finances. And not ecology, for instance.

CONSTANTINOU: Right. You see, with regard to the ecology, with regard to the environmental effects, one has to distinguish between local, national, regional and then global environmental effects. The fossil fuels do create local, national, regional and -- because of the climate change fears -- global impacts on the environment. And this is why there is a lot of talk and a lot of consideration of introducing more benign energy sources.

MORELLO: Like nuclear power, for example?

CONSTANTINOU: Well, nuclear power is one of them with regard to CO_2: it does not produce carbon dioxide --

MORELLO: That's true.

CONSTANTINOU: -- but it produces all sorts of other environmental problems, including the -- well, what can one do with the incredibly dangerous radioactive wastes? No country has discovered the method or where to put these things. But nevertheless, there are a lot of technologies, for the voltaics, wind power, and all sorts of other technologies that are now a fallout, if you like, of the reduction in armaments and the freeing of military technologies, which are now being increasingly applied in the civilian sector. For example, jet engines now are being used for electricity generation from biomass, and they are being introduced on a significant scale in Brazil, for example, for electricity supply to Sao Paulo. Now, this is a very hopeful technological development. One has to evaluate it and see to what extent it will be economic and what the environmental impacts are, but they should be less than conventional sources of energy.

LITTLEJOHNS: Speaking of Brazil, I think Brazil is one of the leading countries in obtaining oil from corn, is it not?

CONSTANTINOU: From sugarcane.

LITTLEJOHNS: From sugarcane?

CONSTANTINOU: That's right.

LITTLEJOHNS: But also from corn?

CONSTANTINOU: Well, from corn in the United States.

LITTLEJOHNS: Yes. Well, anyway, from -- okay, the United States also. Is that worthwhile any more?

CONSTANTINOU: Well, you have conflicting evaluations of that. In Brazil, for example, the alcohol that is being produced and is used instead of gasoline or together with gasoline -- but now you have automobiles in Rio running solely on alcohol -- the information we have is that it is costly. It is about $40 per barrel of oil. And we mentioned before that the price is about $15. But now they are going further and processing the remaining parts of the sugarcane, the pulp, into electricity through the application of these technologies. So one really has to make a very thorough economic evaluation. At the same time, their technology creates a lot of employment. But, you know, a lot of uneconomic investments also create a lot of employment, so one would really want to have economic propositions plus additional employment.

PFAEFFLE: Can I press you again on this one point? Do you think these alternative sources have a real chance against oil, if the price remains at current levels or even drops further? We tend to be going the easy way, always easy to obtain --

CONSTANTINOU: Certainly the lower you go with the price of oil, the more difficult it will be for these energy technologies to find a market. But my personal

opinion is that we need technological breakthroughs for these technologies in order for them to be widely applied.

Now, there are experts who believe, and there are projections made by the World Energy Council, for example, to the year 2020; there are other forecasts or projections made to the year 2050 that show that the contribution of these renewable energy technologies will increase over time. The farther out you go, of course, the more optimistic you can be. The big question is whether it is realistic to expect that these technologies will really answer the problem of the world with regard to energy. There are a few optimists and many pessimists, but I don't think anybody can really forecast what will happen, because one cannot be certain with regard to technologies and breakthroughs in technology.

MORELLO: I find it ironic that Mexico and Venezuela, and to a lesser extent perhaps Brazil, which are petroleum producers, are also leaders in non-conventional energy, whereas countries that need it and do not have petroleum reserves don't seem to be involved in it. What is the reason for that? Is it purely financial again?

CONSTANTINOU: Well, Brazil is certainly very much dependent on oil imports, and especially during the energy crisis of the '70s and early '80s, they had to pay enormous amounts of money, billions of dollars for oil imports. So they have invested heavily both with regard to oil exploration, development of oil per se, and also in the alcohol program. With regard to Venezuela, their main effort is in heavy oil development apart from conventional oil, which again with regard to environment is not comparable to new technologies. But Mexico is active because Mexico is a big country, and they also have an enormous population that depends on rural energy supplies, and therefore they would very much like to have supplies for the rural areas which are environmentally benign.

LITTLEJOHNS: This is World Chronicle. Our guest is Charles Constantinou, Chief of the Energy and Natural Resources Branch of the United Nations Department for Policy Coordination and Sustainable Development.

PFAEFFLE: Mr. Constantinou, Austria recently sent a big delegation to Washington trying to block a nuclear power plant from being built or refurbished in the Czech Republic. That shows the opposition that exists in certain countries against nuclear power. What is your prediction on nuclear power? Does it have a chance, or do you think there will be more of this --

CONSTANTINOU: Well, I think it is certainly true that opposition to nuclear power has become practically world-wide, although right now there are ambitious programs of expansion of nuclear power, for example in Japan. But even there, there is

opposition growing. China has embarked on a nuclear power program, and South Korea, and so forth. So even some developing countries are going into nuclear power.

But I think overall there are very serious economic problems. Nuclear power has not proved to be as cheap as people have forecast in the past. And at the same time, there are enormous problems, as I mentioned before, with regard to the radioactive waste. And also, what do you do when these nuclear power plants have to be put out of commission? They have to be decommissioned, and it costs enormous amounts of capital to bury them in concrete or whatever one is going to do with regard to these nuclear power plants. There are developments, I understand, in nuclear technology, and there is hope -- at least nuclear experts tell us that they will make these power plants more safe, and that they will be of a smaller modular scale and therefore more applicable to many other countries. But in my own personal opinion, they need to improve a lot before these things are applied.

LITTLEJOHNS: Does the United Nations have an official policy with regard to atomic energy?

CONSTANTINOU: The United Nations does not have an energy policy with regard to any source of energy. And very recently something new happened here. We had an energy committee meeting, a meeting of experts from both developed and developing countries, a cross-section of the countries of the world, a cross-section of expertise. And they met for two weeks here in New York in February, and they agreed on a new world energy path, which will be recommended to the Economic and Social Council for approval and then for exhortation to all countries to develop.

These new energy paths fundamentally will consist of more energy efficiency in the use of energy; [the] promotion of new energy technologies for renewable energy technologies; and much bigger effort in the clean-up of conventional fuels, whether it's coal or oil or gas, clean-up to minimize the environmental effects of these fossil fuels; and finally, the substitution of fuels from high carbon, like coal, to gas, which produces the least carbon among the three fossil fuels.

MORELLO: I notice that there is also a problem that has already begun to arise about the disposal of the by-products of photovoltaic cells, toxicity in them. Is that going to be -- I suppose it will not reach the proportions of nuclear power, but it is a problem.

CONSTANTINOU: I think it is a problem, and I think it is a problem that has not received very thorough evaluation as yet. On the one hand, the proponents of new energy technologies are saying that the environmental effects will be minimal. But then one has to study these things in detail, because as you just mentioned, what do you do with the batteries, for example, in an electric car? How do you dispose of them,

especially when they are in the millions? Similarly, with wind power. How many windmills do you want, and where? I mean, many people object to having many windmills outside their window.

MORELLO: Not in my back yard.

CONSTANTINOU: And you have these problems with regard to practically every one of these sources of energy. There is no source of energy which will give us all the benefits without a cost.

LITTLEJOHNS: The space program, Mr. Constantinou, is supposed to have conferred enormous benefits to us down here on earth, particularly in the area of battery technology. What happened to all those wonderful promises?

CONSTANTINOU: Well, I'm not a technologist, but it seems to me one of the most difficult things to crack is batteries. Everybody has been trying to improve batteries, and we never really get the batteries that will do the job. It's amazing.

LITTLEJOHNS: I read somewhere that there's a company in Georgia which is developing a battery which is going to be used by the General Motors Corporation in its electric vehicle. And apparently this could be charged much more rapidly than the ordinary battery. Do you know anything about that?

CONSTANTINOU: Well, one reads about these things, but one hopes to see them in operation.

PFAEFFLE: Mr. Constantinou, interestingly, you said before that the UN doesn't have any particular policy on any source of energy. Does that mean that the UN perhaps is concerned that it might alienate some of its members by coming in on the side of one source of energy? But certainly there must be one source that's preferable to another. So it seems to me the UN should go out focusing on energy sources that are economical and that are environmentally acceptable.

CONSTANTINOU: Well, the United Nations is an intergovernmental organization. All the countries of the world are its members. As and when these countries arrive at a consensus with regard to energy policies, then the United Nations will have an energy policy. I mentioned before that for the first time a committee has agreed on a new energy path which one might call an energy policy. If this is adopted by the Economic and Social Council and adopted by all the countries of the world, then certainly this would become a UN energy policy.

PFAEFFLE: Are we talking about all kinds of esoteric sources of energy like windmills, or this and that? But there is no real focus on, let's say, natural gas. Natural gas is abundantly present everywhere almost. It's cheap to bring up. Gas rises, you

don't have to have any sophisticated technology to bring it up. Yet there's no effort being made on a large world-wide scale to promote natural gas.

CONSTANTINOU: No, I think there is an enormous effort to promote natural gas, and in fact natural gas consumption has been increasing much more rapidly than oil, for example. And there is a lot of international trade going on in natural gas, much more than before, when we think not only in terms of exports from the former Soviet Union to Europe, or from the North Sea or Algeria to western Europe, but also from Indonesia and other countries there to Japan, to South Korea, to other areas there. And there are a lot of projects for liquefied natural gas by which you ship the natural gas with methane tankers or even transcontinental pipelines from the Middle East to bring much more natural gas to Europe. Natural gas is certainly the fuel of the future, but it has already happened and it's happening on a large scale.

PFAEFFLE: But not in cars. Like, you take the United States. A statistic I saw, some hundred thousand vehicles in the United States are fueled by natural gas out of a total car population of two hundred million. So --

CONSTANTINOU: Well, there again you need to make a car to run on natural gas that is competitive with alternatives. And they have not succeeded as yet to do that. But natural gas is being used now not only for energy but also for petrochemicals and for fertilizers and so forth, but increasingly so for electricity generation. World-wide there is a change mainly from fuel oil for electricity generation to natural gas, and now from coal to natural gas generation for electricity.

MORELLO: I wondered in the process of breaking down into non-conventional and conventional uses, hydroelectric and large hydroelectric and traditional, what you call traditional biomass has been included. These are things that have been going on for generations. They're not really non-conventional at all. Because unless it's to show that 18 per cent is non-conventional, whereas if you eliminate those you have only 1 percent. Could you explain?

CONSTANTINOU: Yes. You see, hydropower is a renewable source of energy. Right? And our definition in the UN up to now is new and renewable sources of energy, where we include all these sources together; and altogether they come to 18 per cent of world energy consumption. But the biggest part of it all is hydropower, in fact, because there is a lot of hydropower both in the industrial countries and in the developing countries. And there is, by the way, enormous potential for hydropower development in the developing world. But again, there are problems. There are environmental problems. Increasingly you hear, for example, of silting of dams. All sorts of impacts both on the country itself and on the surrounding seas and so forth.

And in quite a few places you have to move a lot of people who live in that particular area in order to develop hydropower.

In India for example, a big hydropower project, several dams would require the removal of 1.5 five million people away from these sites. That has created enormous problems. And then again, it becomes a triage choice: 1.5 five million people to be removed to supply electricity I don't know to how many other millions among the 850 million people in India.

LITTLEJOHNS: Mr. Constantinou, a recent UN report said that the current oil supplies are sufficient to last about 75 years. Surely that's going to spur an enormous effort world-wide to come up with some alternatives, is it not?

CONSTANTINOU: Well, I don't think so, because when you have a supply to last you for 75 years -- and in the UN report we were very careful to say that it is the minimum, and all the qualifications we put in the report would indicate that there will be oil for many, many more years than those 75 that we mentioned; that is based on proved and probable reserves. But as we discussed before, all these technological developments are going on. Personally I'm confident there will be a lot more oil and a lot more gas.

LITTLEJOHNS: Mr. Constantinou, that's all the time we have. Thank you for joining us on this edition of World Chronicle.

Our guest has been Charles Constantinou, Chief of the Energy and Natural Resources Branch of the United Nations Department of Policy Coordination and Sustainable Development. He was interviewed by Walter Pfaeffle of the Kuwait News Agency and Ted Morello of the *Far Eastern Economic Review*. I'm Michael Littlejohns. Thank you for joining us. We invite you to be with us for the next edition of World Chronicle.

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